

REMARKS

This is in response to the Office Action mailed January 3, 2006, in which the Examiner rejected claims 25-48. With this Amendment, Applicant has amended claims 25-34 and 36; canceled claims 35 and 37-48; and added new claims 49-62. A list of the pending claims in unmarked format is provided in the Appendix to this document.

Reconsideration of the application as amended is respectfully requested.

Request for Acknowledgement of Submitted References

As a preliminary matter, Applicant requests that the Examiner acknowledge that the references cited in the Supplemental Information Disclosure Statement filed February 1, 2005 have been considered. Copies of the Supplemental Information Disclosure Statement and return post card are enclosed herein. Applicant requests consideration and entry of the cited references.

Claim Amendments

The amendment to independent claim 25 and the cancellation of independent claims 39, 44 and 45 were not necessitated by the rejections presented in the Office Action, to which this response pertains. More particularly, the originally submitted claims were not disclosed or rendered obvious by the cited references.

For example, originally submitted claim 25 included a controller configured to "provide a display signal to the display systems such that the display system displays objects in substantially a correct perspective of an observer located at the location of the mobile body." Endo et al. fail to disclose such a feature. Items 2000-2001 of Fig. 17 of Endo et al. cited by the Examiner and the corresponding description do not disclose the

feature of claim 25. Rather Fig. 17 illustrates a birds-eye view for the purpose of illustrating a method of generating a road and is unrelated to the feature of claim 25. Such a birds-eye view is not a possible view "from a perspective of a user", as described in claim 25 when read in light of the specification. Similar features are also provided in independent claims 39 and 44, which are not disclosed by Endo et al. or other references cited by the Examiner. Accordingly, the claims are allowable in view of the cited references since they fail to disclose all of the claimed features.

With regard to previously submitted claim 45, none of the cited references disclose "a controller coupled to the location system, the data storage system and the neurostimulation system, and configured to receive the location signal and retrieve object information based on the location signal and provide a stimulation signal to the neurostimulation system." In particular, the cited sections of Abreu disclose a device that is surgically implanted in the brain, surgically implanted in the eye, or placed on the eye. Nowhere is there any disclosure or suggestion in Endo et al. or Abreu of coupling the device of Abreu to a controller of a mobility assist device or providing neurostimulation based on a location signal and object information, as described in claim 45. Accordingly, originally filed claim 45 is allowable in view of the cited references for at least the failure to disclose all of the claimed features.

Accordingly, the claim amendments and cancellations do not constitute an admission by Applicant that the rejections were proper or that Applicant agrees with the Examiner's interpretation of the cited references.

Claim Rejections - 35 U.S.C. § 102

In Section 1 of the Office Action, the Examiner rejected claims 25 and 33 under 35 U.S.C. §102(e) as being anticipated by

Endo et al. (U.S. Patent No. 6,289,278 B1). Applicant respectfully believes that the rejections can be withdrawn.

Independent claim 25 has been amended to describe the controller as being configured to generate the display signal "based on the location signal, the object information and the location of an operator of the mobile body". Endo et al. fail to disclose such a controller or such a display signal. In particular, the display signal of Endo et al. used to generate the display is generated without regard to a location of the operator of the vehicle in which the display is provided. That is, while the display may change in response to a change in the relative positions of the vehicles on the road, the display of Endo et al. does not change based on a location of the driver. For example, if the driver's position was switched from the left side of the vehicle to the right side of the vehicle, the display would remain the same.

Accordingly, claim 25 is not anticipated by Endo et al. Additionally, Applicant submits that all claims depending from claim 25, including claim 33, are allowable for at least the reasons set forth above with regard to claim 25.

Claim Rejections - 35 U.S.C. §103

In Section 2 of the Office Action, the Examiner rejected claims 26-28 under 35 U.S.C. §103(a) as being unpatentable over Endo et al. in view of Zamojdo et al. (U.S. Patent No. 6,272,431 B1). Applicant respectfully believes that the rejection can be withdrawn.

Applicant submits that claims 26-28 are allowable for at least the reasons set forth above with regard to claim 25, from which the claims depend. Accordingly, Applicant requests that the rejections be withdrawn.

With regard to claim 27, neither Endo et al. nor Zamojdo et al. disclose the display of virtual images such that "when viewed

from the perspective of the operator, the virtual images appear to be projected on the corresponding real world objects", as provided in claim 27. Instead, Zamojdo et al. provide a head-up display that presents an image that appears to be "substantially parallel to the ground traversed and high above it" [Column 2, Lines 31-40; Fig. 3]. Accordingly, the feature of claim 27 is not disclosed by the cited references.

In Section 3 of the Office Action, the Examiner rejected claims 29-32 under 35 U.S.C. §103(a) as being unpatentable over Endo et al. in view of Lemelson et al. (U.S. Patent No. 6,226,389 B1). Applicant respectfully believes that the rejections of claims 29-32 can be withdrawn for at least the reasons set forth above with regard to claim 25, from which the claims depend.

In Section 4 of the Office Action, the Examiner rejected claims 34 and 38 under 35 U.S.C. §103(a) as being unpatentable over Endo et al. in view of Steid (U.S. Patent No. 6,196,845 B1). Applicant respectfully believes that the rejections of claims 34 and 38 can be withdrawn for at least the reasons set forth above with regard to claim 25, from which they depend.

In Section 5 of the Office Action, the Examiner rejected claim 36 under 35 U.S.C. §103(a) as being unpatentable over Endo et al. in view of Forrest et al. (U.S. Patent No. 6,297,516 B1). Applicant respectfully believes that the rejections of claim 36 can be withdrawn for at least the reasons set forth above with regard to claim 25, from which they depend.

New Claims

With this Amendment, Applicant has added new independent claims 54 and 60. Independent claim 54 is directed to a mobility assist device that includes "a controller configured to generate

the display signal based on the location signal, the object information and a location of the display." Applicant submits that none of the cited references disclose such a device. More particularly, Applicant submits that Endo et al. fail to generate a display signal that is based upon a location of the display device. Accordingly, Applicant believes that independent claim 53 and its dependent claims are in condition for allowance.

Claim 60 is directed to a method of providing mobility assistance for a mobile body that includes "generating a display signal using the controller based on the object information, the location signal and at least one of a location of an operator of the mobile body and a location of the display." Applicant submits that none of the cited references disclose such a method. More particularly, Applicant submits that Endo et al. fail to disclose the step of generating a display signal for at least the reasons set forth above with regard to claim 25 and 54. Accordingly, Applicant believes that independent claim 60 and its dependent claims are in condition for allowance.

Conclusion

In view of the above comments and remarks, Applicant submits that the present application is in condition for allowance. Reconsideration and favorable action is respectfully requested.

The Director is authorized to charge any fee deficiency required by this paper or credit any overpayment to Deposit Account No. 23-1123.

Respectfully submitted,

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APPENDIX

1-24. (canceled)

25. A mobility assist device, comprising:

- a mobile body configured for travel over a surface;
- a location system configured to generate a location signal indicative of a location of the mobile body;
- a data storage system storing object information indicative of locations of real world objects;
- a controller configured to generate a display signal based on the location signal, the object information and a location of an operator of the mobile body; and
- a display attached to the mobile body and configured to generate virtual images of the real world objects based on the display signal.

26. The mobility assist device of claim 25 wherein the display is configured to provide a conformal augmented display of the objects based on the display signal.

27. The mobility assist device of claim 25 wherein the display is positioned in a field of view of the operator and the display presents the virtual images such that, when viewed from the perspective of the operator, the virtual images appear to be projected on the corresponding real world objects.

28. The mobility assist device of claim 27 wherein the display comprises:

- a projection system providing a projection of the virtual images; and
- a partially reflective, partially transmissive, screen positioned in the field of view of the observer of the mobile body.

29. The mobility assist device of claim 25, wherein:
the device further comprises a ranging system configured to generate a detection signal that is indicative of a location of transitory objects relative to the mobile body; and
the controller is configured to generate the display signal based on the detection signal.
30. The mobility assist device of claim 29 wherein the display is configured to display virtual images representing the transitory objects in response to the display signal.
31. The mobility assist device of claim 25 wherein the controller is configured to filter the display signal based on operator-selected criteria.
32. The mobility assist device of claim 30, wherein the controller is configured to filter the display signal such that the display only presents virtual images representing transitory objects and real world objects that have been selected for display based on the operator-selected criteria.
33. The mobility assist device of claim 25, wherein:
the device further comprises a mobile body orientation detection system configured to generate an orientation signal that is indicative of an orientation of the mobile body; and
the controller is configured to generate the display signal based on the orientation signal.

34. The mobility assist device of claim 27, wherein:
the device further comprises a head orientation tracking system configured to generate a head orientation signal that is indicative of an orientation of the head of the operator; and
the controller is configured to generate the display signal based on the head orientation signal.

35. (canceled)

36. The mobility assist device of claim 25 wherein the display comprises a device selected from the group consisting of a helmet-mounted display; a visor-mounted display; an eyeglass-mounted display; and a liquid crystal display.

37-48. (canceled)

49. The mobility assist device of claim 25, wherein the display signal is further based on a location of the display relative to the mobile body.

50. The mobility assist device of claim 25, wherein the object information includes information indicative of locations of first and second boundaries of a path.

51. The mobility assist device of claim 50, wherein the display is configured to generate virtual images of the first and second boundaries of the path on the display signal such that, when viewed from the perspective of the operator of the mobile body,

the virtual images of the first and second boundaries appear to be projected on the corresponding real world first and second boundaries of the path.

52. The mobility assist device of claim 51, wherein the first and second boundaries of the path correspond to right and left lane boundaries of a lane of a road.

53. The mobility assist device of claim 25, wherein the mobile body comprises the operator.

54. A mobility assist device, comprising:
a mobile body configured for travel over a surface;
a location system configured to generate a location signal indicative of a location of the mobile body;
a data storage system storing object information indicative of locations of real world objects;
a display attached to the mobile body and configured to generate virtual images of the real world objects based on a display signal; and
a controller configured to generate the display signal based on the location signal, the object information and a location of the display.

55. The mobility assist device of claim 54, wherein the display is configured to present the virtual images in such a manner as to generate a visual effect of the virtual images being projected on the corresponding real world objects when the virtual images are viewed by an operator of the mobile body.

56. The mobility assist device of claim 55, wherein the display signal is further based on a location of the operator of the mobile body.

57. The mobility assist device of claim 54, wherein the object information includes information indicative of locations of first and second boundaries of a road.

58. The mobility assist device of claim 57, wherein the display is configured to generate virtual images of the first and second boundaries of the road based on the display signal such that, when viewed from the perspective of an operator of the mobile body, the virtual images of the first and second boundaries appear to be projected on the corresponding real world first and second boundaries of the road.

59. The mobility assist device of claim 58, wherein the first and second boundaries of the road correspond to right and left lane boundaries of a lane of the road.

60. A method of providing mobility assistance for a mobile body comprising steps of:

- providing a mobile body configured for travel over a surface;
- providing a mobility assist device comprising:

- a location system;

- a data storage system containing object information indicative of locations of real world objects;

- a controller; and

- a display attached to the mobile body;

generating a location signal using the location system that is indicative of a location of the mobile body;
generating a display signal using the controller based on the object information, the location signal and at least one of a location of an operator of the mobile body and a location of the display; and
displaying virtual images on the display that are representative of the real world objects based on the display signal.

61. The mobility assist device of claim 60, wherein the displaying step further comprises displaying the virtual images in such a manner as to generate a visual effect of the virtual images being projected on the corresponding real world objects when the virtual images are viewed by an operator of the mobile body, based on the display signal.

62. The mobility assist device of claim 60, wherein:
the object information includes information indicative of locations of first and second boundaries of a road; and
the displaying step comprises displaying virtual images of the first and second boundaries of the road such that, when observed from the perspective of the operator, they appear to substantially overlies the corresponding real world first and second boundaries of the road.